

DEMAND FORECASTING THROUGH MARKET POTENTIAL FOR GLUTEN-FREE FOOD INDUSTRY IN INDIA AND USA

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ABSTRACT

Celiac disease is a systemic autoimmune syndrome involving a gluten-induced chronic inflammation of small bowel mucosa with extensive short and long-term negative health consequences if untreated, including cancer. Gluten-free food was among the top ten most-searched words on Google in 2016. The global gluten-free market is projected to reach US\$6.2 billion by 2018. The present study aimed to find the potential of gluten-free foods in the world, USA and India. The USA has the largest market for gluten-free foods and India has the largest population of celiac patients in the world. The study sought to explain the gap between expected potential and current market share of gluten-free foods. The gap estimates could be used by leading manufacturers of gluten-free brands to grab the untapped potential of gluten-free foods market. Reasons for market expansion and categories of gluten-free foods which can perform well in India and USA are explored. The study also explored the market potential, according to age and gender demographics for both nations and some possible underlying reasons. The study covered sources of information, including gluten-free forums on social media, blogs, news media sources, expert interviews, thought leaders, specialists and journalists covering specialty food, allergies and health issues at local, regional and global platforms.

KEYWORDS: Gluten-Free, Celiac, Market, Allergy, Food Science & Big Data

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INTRODUCTION

Celiac disease is a systemic autoimmune syndrome. It involves a gluten-induced chronic inflammation of small bowel mucosa with extensive short and long-term negative health consequences. It might even lead to cancer. It is often misdiagnosed as irritable bowel syndrome (IBS) or stress. Currently the only treatment for celiac disease is a strict, 100% gluten-free diet. 2.2 million children under five years of age have been undiagnosed in India. Celiac disease constitutes 4% to all childhood diarrheal mortality [1]. The estimated population prevalence of diagnosed celiac disease in many western countries approaches 1% to 2–5%. Gluten-free food was among the top ten most-searched words on Google trends in 2016. Gluten-free products are specialty products that are intentionally prepared for consumers who want to buy a substitute for wheat-, barley- or rye-based products. In baking, gluten is a protein in the flour that gives distinctive structure to baked foods [2].

Gluten-free products are purchased by people having celiac disease (CD), non-celiac gluten sensitivity, wheat allergy, autism, ADHD, multiple sclerosis and irritable bowel syndrome (IBS). Gluten-free foods are purchased for health benefits like weight management, increased energy levels and higher concentration power.

The market for gluten-free products has grown to about 40 million consumers. Among them four million have celiac disease, 18 to 22 million have gluten sensitivity, 12 million consumers are classified as gluten-intolerant and experience GI distress but have not given up gluten completely. An estimated three million people purchase gluten-free products for fad or non-medical reasons [3]. Top reasons consumers provided for purchase of gluten free foods include reasons like good health (25%), managing weight (19%), recommended by friends (18%), higher quality product (17%), low-carbohydrates (16%) and 5% due to other reasons.

The global gluten-free market is projected to reach US\$6. 2 billion by 2018 with North America contributing about 59% of the share [4]. North America is the largest market for gluten-free products, accounting for a market share of 52% in 2014. With the increasing rate of diagnosis and awareness about celiac disease globally, the demand for gluten-free products is projected to grow in terms of value at the highest CAGR of 10.7% from 2015 to 2020 in the Asia-Pacific region. The demand has also been increasing in India as consumers demand more processed food varieties in gluten-free segment. Despite of high growth rate, gluten-free foods are facing problems to establish in the market due to high price, lack of awareness about the products, increased number of un-diagnosed cases and an inefficient value chain for gluten-free products. The present study aimed to find out the potential of gluten-free foods in the world, USA and India. The USA is the largest market of gluten-free foods. India has the largest population of celiac patients in the world because it is a major wheat consuming country. This study also tried to explain the gap between expected potential and current market share of gluten-free foods. The gap estimates could be used by leading manufacturers of gluten-free brands to grab the untapped potential of gluten-free foods market.

METHODOLOGY

Sources of Data-Expert interviews were conducted in India and USA. Twenty experts were interviewed from each country which included doctors, retailers, manufacturers and store managers. Secondary data was majorly collected from research journals, reviews and forums. Important sources include the Celiac Society of India, Celiac Society of America, Foundation of celiac awareness, Markets and Markets report 2014, 2015, Mintel and Nielsen database. The study covered sources of information, including gluten-free forums on social media, blogs, news media sources, expert interviews, thought leaders, specialists and journalists covering specialty food, and allergies at local, regional and global platforms. Sorting of unstructured data was done into organized data. Machine learning and NLP (Natural language processing) were used to clean, categorize and contextualize the food consumption patterns. Sentiment analysis of editorial and social media data, i.e. big data was also carried to increase efficiency of the study. Data support for editorial & social media and sponsorship for survey work in the USA was provided with Perspectory Media Insights. Max foods, Dr. Gluten (Divine foods), Beewell foods and Nagrain foods provided survey assistance in India.

The market potential is defined as the maximum capacity of a defined market for a specific product/ service within a defined time period [5].

Market Potential per year = Number of patients x average per day consumption of gluten-free foods x 365

RESULTS AND ANALYSIS

Table 1: Market Potential of Gluten-free Foods in World, India and USA

Region	Approx Users of Gluten-free Foods	Total Potential in KiloTons (KT)
World	73,466,330	13000.17
India	13,268,015	2347.31
USA	3,257,269	511.89

Source: Authors own compiled data

Table 1 shows market potential of gluten-free foods in the world, India and USA. To calculate the market potential average per day, calorie consumption for males was taken as 2500 calories and females as 2000 calories according to WHO standards.

Calories were converted into grams of fat, protein and carbohydrate. According to The Institute of Medicine, USA and Indian Medical Association, the ideal percentage of carbohydrate should be 45-65%, proteins 10-35% and less than 30% fat in daily calories in the diet. Dietary fat contains 9 calories per gram, while protein and carbohydrates provide 4 calories per gram. An estimate of 1% population of each region, including world's population was considered as a user of gluten-free foods. Estimated potential tells about the size of the market, which could be tapped and it is different from market share. Market share tells about the current market sales that how much gluten-free food is actually being sold, but the market potential tells that how much gluten-free food could be sold. It is estimated that only 10 -20% of celiac patients are currently being diagnosed. In some countries diagnosis rate is only up to 5%. Approximately 70-80 % of all cases remain undiagnosed, in many cases, sufferers represent either ambiguous symptoms or no symptoms at all. High prices of gluten-free foods are a major challenge for retailers and manufacturers. It is restricting them to reach to their maximum potential. According to Packaged Facts, 53% consumers considered gluten-free foods, over-priced [4].

The total world potential of gluten-free foods is about 13,000 Kilotons. According to Markets & Markets 2016 report, the USA accounted for nearly 50% market share, Europe, 30%, Asia-Pacific 12-15 % and the rest of the world about 5% share. The USA has the largest gluten-free market, followed by Europe and Asia-Pacific. Users of gluten-free foods demand for clean labels, ease of digestion, need to avoid allergens, compatibility with vegetarian and vegan lifestyles and concerns about sustainability among the general population. Legumes, beans, pulses, ancient grains and sprouted grains are found in the growing array of gluten-free foods. They provide high fiber, nutrition and protein.

USA has the potential of 511.89 Kilotons and in 2016 its market share was 205 Kilotons. At the USA rate of diagnosis of gluten allergy or celiac disease is 20-30%. According to Packaged Facts 30% of consumers purchased gluten-free products non-purposefully because many products are labeled gluten-free or naturally gluten-free (e.g. Popcorn and potato chips). 29% considered them healthier, 20% for managing weight, 18% considered them of higher quality, 15% due to gluten sensitivity or food allergies, 9% purchase them due to celiac disease and 5% purchased them because of other reasons. The key players in this market were the Boulder Brands Inc., The Hain Celestial Group, Inc., General Mills, Inc., Kellogg's Company, The Kraft Heinz Company., Dr. Schar, Udi's, Pamela's and Glutino.

USA has many exclusive gluten-free restaurants, bakeries and stores which increased its market potential as people from distant places come to buy gluten-free products or to get customized gluten-free cakes, cookies and other products. Many celiac clubs and gluten-free clubs exist in the USA, where members create awareness about gluten-free foods and gluten-related allergies. In other areas where the population is highly scattered, gluten-free products are available

in fewer big food stores like Walmart, Whole foods, Trader Joe's, Wegman's etc. Small stores keep very limited gluten-free foods or naturally gluten-free labels general foods like chips, popcorn, tortillas and energy drinks. Many consumers prefer semi-processed gluten-free foods like flours and mixes and love to experiment and cook their own dishes. Local bakeries are very famous due to customized and personalized gluten-free foods.

India has gluten-free market potential of 2,347 Kilotons, but has a comparatively lower market share of 7.55 Kilotons in 2016. In India, the rate of diagnosis is only 5-7% because 70% of the Indian population live in villages. Villages have inadequate access to medical care, thus many patients are misdiagnosed. In India, ancient grains like rice, corn, sorghum, buckwheat, quinoa and amaranth are mostly used to prepare gluten-free flour. Legumes and nuts are used to prepare flour and mixes. In India, rising disposable income and increasing health-consciousness among consumers has been driving the demand for processing food products. Consumers demand wholesome and balanced nutrition in the form of processed food products. Gluten-free product categories are considered as an important segment in the growth of the processed food industry in this region. The demand for gluten-free crackers, breads, biscuits and cookies have increased in the last few years. The rising population and the increasing demand for healthy food has strengthened the demand for gluten-free products in India. The demand for soups and sauces with corn and rice flour ingredients is projected to boost the savory segment. In big cities like Delhi, Chandigarh, Jaipur and Bangalore, people are also demanding gluten-free pizza, pasta and noodles. Exclusive gluten-free restaurants were opened in big cities of India. Northern India is wheat consuming belt, thus potential for gluten-free food is highest here. In India, mainly flour and mixes lead the market segment of gluten-free foods. Along with increasing awareness, people are attracted towards other food categories like snacks, pizza, pasta, fast foods and desserts. However categories like cereals and corn flakes, energy drinks and gluten-free beverages have not picked the market yet, due to lack of product demand and availability. A few leading brands in India were Dr. Schar, Dr. Gluten, Gluten-free foods at Nature's Basket, Zero G, Bee well, Savor life, Anmolpreet, Kalpana foods, Nagrain etc.

Table 2: Gap Estimation between Market Potential and Existing Market Share

	Market Share (KT)	Estimated Value (Mn USD)	Market Potential (KT)	Estimated Value (Mn USD)	Gap in Potential (KT)	Gap in Value (Mn USD)
World	430	4,515	13,000.17	136,501.785	12,570.17	131,986.785
India	7.55	79.275	2,347.31	24,646.755	2,339.76	24,567.48
USA	205	2,152.5	511.89	5,374.8	306.89	3,222.3

Source: Authors own compiled data

Conversion factor 1KT=10.5 Mn USD from *Markets and Markets* report, 2015

Table 2 shows the gap estimation between market potential and existing market share. According to the existing market share the world has achieved only 3.31% market share out of the total world potential of gluten-free foods in 2016. Major reasons for this gap were lack of awareness, lower rate of diagnosis of celiac disease and other wheat allergies, lack of purchasing power in developing countries like India, Pakistan, Morocco and parts of China. However the opportunity lies in the Asia-Pacific region as well. The market for gluten-free products is irregularly arranged and is clustered mostly near America and Europe. The USA, as the largest market of gluten-free foods, has acquired market share up to 40.05% of its total potential. USA offers the highest variety in all sections of gluten-free foods. However, due to lack of fiber, nutrition, and taste, in addition to the high price, people in the USA often demand products made from ancient grains, legumes and nuts which are good in taste and high in nutrition at affordable prices. Organic gluten-free foods and

Veganism have also been on-trend in the last few months. India has a huge disparity between market share and market potential. According to the experts and estimated market share only 0.5-2% of the market had been captured by now. Major reasons were lack of diagnosis of gluten-free products, difference in taste preferences, low quality of local foods and products generally lacking in nutrition, fiber and taste. Product awareness is less in rural areas and small towns. In addition, many doctors have done lobbying to promote a few particular brands, which do not allow other brands, especially the global ones, to enter into the market.

Table 3: India: Market Potential & Market Share 2016-2020

	2016e	2017p	2018p	2019p	2020p
Market Potential (KT)	2347	2376.86	2408.14	2439.81	2471.63
Market Share (KT)	7.55656	8.372668	9.276917	10.27882	11.38894

e – Estimated; p – Projected

Source: Expert Interviews, Related Associations/Institutes, Related Research Publications, Government Publications, and Markets and Markets Analysis

Table 3 shows estimated and projected market potential and market share of India in 2016-2020. The market share of gluten-free products is expected to grow at 8.7% growth rate. Market share would increase in coming years due to increased rate of diagnosis of celiac disease and awareness amongst people about quality gluten-free foods. The coming five years could provide ample opportunities for global brands of gluten-free products to make inroads in Indian markets through existing channels, especially in big cities where people have already started demanding for better products. Also online marketing would provide an efficient medium for global companies to tap small and scattered markets, especially in small cities. Preparing attractive product combos at reasonable prices and launching retail packaging for flour, cookies, biscuits and noodles could help to get a higher market share and to reduce the wide gap between actual potential and existing market share.

Table 4: USA: Market Potential & Market Share 2016-2020

	2016e	2017p	2018p	2019p	2020p
Market Potential (KT)	511.89	512.33	515.8012	519.2882	522.8066
Market Share (KT)	217.3	230.338	244.1583	258.8078	274.3362

e – Estimated; p – Projected

Source: Expert Interviews, Related Associations/Institutes, Related Research Publications, Government Publications, and Markets and Markets Analysis

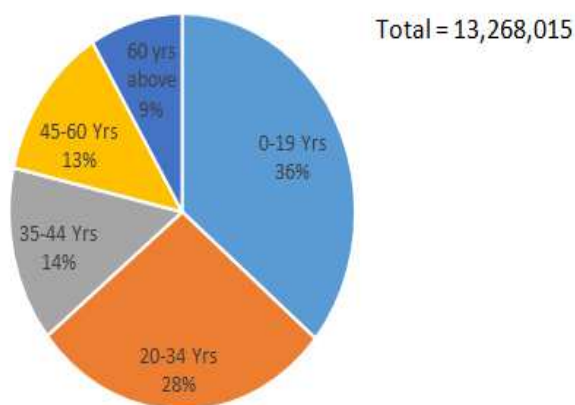
Table 4 shows estimated and projected market potential and market share of the USA from 2016-2020. The market for gluten-free products is expected to grow at 6% growth rate. In coming years demand for organic and nutritious gluten-free products would increase. Gluten-free products prepared from multi-grains, seaweeds, and legumes are getting more popular instead of traditional gluten-free foods made from corn and rice. Desire for whole grains is building up amongst the users of gluten-free foods.

Table 5: Market Potential According to Gender Demographics

Region	Food Potential of Males (KT)	Food Potential of Females (KT)
World	7,273.63	5,726.54
India	1,311.01	1,036.3
USA	252.874	259.016

Table 5 shows market potential, according to gender demographics. In the case of world and India, males are expected to have more potential. In the USA, females are expected to have more potential.

In the USA, as far as the product preference is considered, males like gluten-free snacks like crisped rice, chips, fish, gluten-free beer, nachos, chicken wings, energy drinks, burritos and pastas. Females report greater interest in gluten-free flours and mixes and. Desserts, like cupcakes, muffins, and chocolates. There are a few dishes which are popular among men and women, including gluten-free pizzas, noodles, wraps, cakes, breads and buns and soups. In India, since abundant gluten-free options are not available, gender distinction is more difficult. Males mostly prefer home cooked roti made from rice or corn or cooked rice and vegetable. In snacks, chocolate cookies and plain cookies are preferred. Females also most of the times like to prepare dishes from flour and mixes. Noodles, cakes, pastries, snacks (namkeen, smosa) and biscuits are preferred by females.

India-Potential by age demographics**Figure 1: Market Potential by Age Demographics in India**

Source: Authors own compiled data

Figure 1 shows the market potential by age demographics in India. The chart shows the maximum potential for gluten-free foods lies in coming generation which is about 0-19 years. Major reasons are increased rate of diagnosis of celiac disease in children, increased awareness about gluten-free products, and increased demands of children to get more food variety of good taste that compelled them to buy gluten-free products. Food sections like snacks, fast food and desserts have increased due to increase in demand by children. Many bakeries in India now offer customized snacks, cakes and cookies. Thus, in coming few years the market share for gluten-free foods is expected to grow tremendously in India.

USA-Potential by age demographics

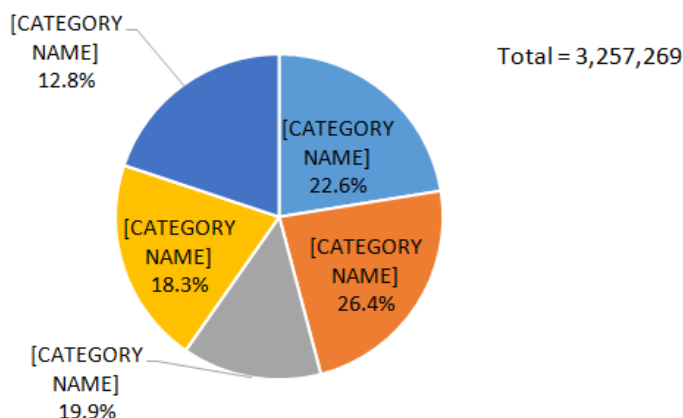


Figure 2: Market Potential by Age Demographics in USA

Source: Authors own compiled data

Figure 2 shows the market potential by age demographics in the USA. In pie chart youngsters from age group of 20-34 years has maximum potential of 26.4%, followed by teenagers and children from age groups of 0-19 years. This is the reason that the sales of gluten-free foods in the USA are increasing because the young generation is fond of gluten-free foods and likes to experiment different variety of gluten-free foods available. It is also considered trendy amongst youngsters to consume gluten-free foods. Some youngsters buy it or manage weight or to be more energetic, assuming that gluten induces sleep during working hours.

CONCLUSIONS

From above, we could estimate that the current market share in the USA is about 40% of its expected potential, but in India it is only 10% of expected potential. USA has a wide range of gluten-free foods, but consumers are striving to get nutrient-rich gluten-free products mainly through multi-grains, and legumes. In India, gluten-free market is at niche stage. Consumers have shown high interest in snacks section and bakery section along with fortified flours and mixes. Online marketing is very successful in both countries. More consumers could be attracted by preparing attractive combos and offers for increased online purchases.

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